

Conclusions: Suggesting Solutions to the Issues of Tropical Zooarchaeology

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This special issue of the journal *Archaeofauna* attempts to address some of the difficulties that face tropical zooarchaeology. Emery's introduction to the issue defines the two main themes - methods and interpretation - and, within these themes, the subject topics of the papers presented at the original SAA forum on which this journal issue is based. In this *Archaeofauna* special issue, authors from around the world address these main themes and their associated subtopics from various viewpoints. Chase *et al.* (this volume) also discusses more broadly how these problems and solutions affect larger archaeological projects and non-zooarchaeologists. This concluding article summarizes the papers included in *Tropical Zooarchaeology*, and highlights the many solutions the authors herein have contributed toward our primary goal of making the most of the tropical faunal data.

METHODS

Both the discussion throughout the original forum and the papers presented here emphasize problems in recovery methods that are in no way particular to tropical zooarchaeology. Since preservation in the tropics is highly variable and often quite poor, our zooarchaeological recovery methods should focus on maximizing the data recovered and ensuring that the results are as reliable and comparable as possible.

Emery (this volume) suggests starting with a quantifiable ranking system for the preservational condition of remains, so that we know what

"excellent" or "poor" conditions truly mean to an author. We also need to recognize that differential preservation exists not just between sites, but also between deposits within a site (McKillop *et al.*, 2003; Chase *et al.*, this volume; Emery, this volume; Iglesias *et al.*, this volume). For instance, Iglesias *et al.* (this volume) finds that anaerobic silts beneath the ocean provide excellent preservation, in contrast to dry-land terrestrial collections, allowing for a greater understanding of the past.

Quitmyer (this volume: pp) suggests the importance of using nested sieves as a sampling strategy that allows one to "visually and statistically evaluate the biases" that may or may not be occurring in the field. Such a method can provide a compromise with archaeologists who argue either that nothing significant will be found by screening with gauges finer than $\frac{1}{4}$ in (6.35 mm) or that such techniques are too costly in time. A few samples throughout a site can confirm what may or may not be missing because of preservation and screen size. Having a consistent recovery test across a region can allow for a real evaluation of sample representativeness (Emery, this volume). Quitmyer (this volume) and Fradkin (this volume) further emphasize that without fine screening their research faunal assemblages would have represented very skewed pictures biased toward larger animals (both taxa and individuals).

Once an appropriate data set has been recovered, a good comparative collection becomes essential. In such a highly diverse environment, comparative specimen procurement strategies must be as complete as possible. Wake (this volume) suggests starting at the local market, but cautions us neither to rely on modern dietary preferences

nor to forget “trash fish”, since modern analogies don’t necessarily explain past preferences. He also suggests visiting different areas and during different seasons to ensure that microenvironmentally- or seasonally-specific taxa are not excluded. To further hone comparative collections he suggests that we make sure to include different sizes, ages, and sexes to allow for “individual and ontogenetic variation within and across species” (Wake, this volume: pp.)

Of increasing importance, with the development of global expertise, is our assistance in creating and supporting “in-country” comparative collections. We can no longer assume that our host countries will allow us to export our assemblages for research. These local collections can include contributions by multiple researchers and also serve for training new specialists (Chase *et al.*, this volume; Cooke & Jiménez, this volume; Emery, this volume; Wake, this volume). Even if one’s own assemblage can travel, it is important to use established comparative collections that appropriately represent regional species.

Additionally, Cooke & Jiménez (this volume) and Wake (this volume) emphasize that it is important to take identifications to their most specific level possible (given cautions about over-identifications in the face of taxonomic complications in the tropics), and that such specificity is particularly helpful for discerning catchment areas and procurement techniques. However, occasionally specific identifications are simply not possible since not every preserved bone is a diagnostic element. Identification field guides and natural histories are useful (Wake, this volume) as is direct work with taxonomists and biologists (Cooke & Jiménez, this volume).

At times, the mere presence or absence of species within a faunal assemblage can have great significance for determining changes in climate and environment. Kydd & Piper’s research (this volume) demonstrates that primate humeri vary consistently by species and are adapted to particular environmental and ecological conditions. For example, recognizing specific species of the leaf-eating monkeys in their study could reveal details of environmental change in the region. More broadly, Stewart’s research (this volume) provides a possible resolution, through regional faunal assemblage comparability, to conflicting interpretations about the age of site formations. Animals can have quite specific life histories, and this information can be most helpful to our analysis and interpretations.

INTERPRETATIONS

The papers in this journal issue show that, by paying more attention to zooarchaeological preservation, recovery, and identification biases, we can overcome the difficulties imposed on our sample by the tropical environment. The papers also consider how our interpretations can contribute to broader research interests from a wide variety of areas from archaeology through biology, anthropology, ecology, and beyond.

The papers present many new suggestions and techniques that offer great promise to our research. Avenues explored include the use of new techniques to answer non-traditional questions; the use of different theoretical models to broaden our interpretive abilities; and the need both for more sophisticated initial interpretation for presentation to the archaeological community, and for broader final dissemination in all appropriate languages.

Archaeological discussants attending the 2003 SAA forum suggested that zooarchaeologists often don’t take their interpretations far enough. If we want to see our data integrated into the larger research picture, we must ourselves take it there. When we can effectively demonstrate how analysis contributes to the larger questions via our own research, then other non-zooarchaeologists will be able to integrate the results from there.

New techniques available in zooarchaeological research help refine our data analysis and increase the extent to which we can approach non-traditional issues. For example, Rabett (this volume) used microscopic wear analysis to reduce the misidentification of worked pig tusks in Malaysia and therefore the misinterpretation of ancient economics. Rabett further honed this work using ethnographic and modern samples to better distinguish between known natural and worked tusks.

White’s review (this volume) of isotopic bone analysis reveals the great potential of this avenue of research for zooarchaeological interpretation. Her work on human isotopic signatures in the Mesoamerican world has provided a cross-check of the types of meat our ancient populations were consuming (see Teeter, 2004, for example). By combining these data with our direct zooarchaeological analyses we can verify interpretations about hunting, domestication, husbandry, and environmental changes. New techniques for faunal analysis provide unique opportunities to expand the types of data that archaeologists can use to answer the broader questions.

Not only are our techniques becoming more innovative and thereby contributing greater depth to our interpretations, so too are our theoretical frameworks. Ethnographic and ethnohistoric analogies have long been used for other classes of archaeological material, but it is often difficult to find relevant literature for animal-use practices. However, zooarchaeologists specializing in African hunter-gatherer populations have conducted ethnoarchaeological research (see Hudson, 1991, for example) that provides possible solutions for missing cultural examples.

Several current articles further this type of research. Mutundu's detailed ethnographic research in Southern Kenya (this volume) highlights the faulty assumptions that have been made in the use of age/sex profiles for determining domestication and hunting patterns. On the Hawaiian islands, O'Day's research (this volume) created a comparative catchment base using modern surveys to identify areas that were potentially useful for fishing and collecting resources in the past. In the Maya area, Linda Brown's (2003) research on hunting shrines in the highland Guatemala area provides a cornucopia of data that highlights the multiple discard behaviors that a single assemblage can reveal. Finally, my own research at Caracol, Belize, has provided many previously unknown ethnohistorical references to ancient Maya animal uses that emphasize the potential dietary biases we can impose on our interpretations of the past (Teeter, 2001). The examples given above and many other zooarchaeological analyses (see Zeder, 1991, for example) provide a great foundation on which to build our further interpretations.

FINAL THOUGHTS

A few final comments emphasize the larger issues of context and dissemination that zooarchaeologists should remember in undertaking their research. Chase *et al.* (this volume) point out that zooarchaeologists need to collaborate more closely with project archaeologists for a finer understanding of the contexts of excavated deposits as well as greater insight into the results from other archaeological datasets from the same excavations. This sort of control is necessary to refine analysis and improve the ideological and ritual interpretations that can be made with our data. At

Caracol, we have seen real benefits, for the interpretation of ritual events, from the close collaboration between zooarchaeology and archaeology, through the correlation of context and associated artifacts (Teeter, 2001; Chase *et al.*, this volume). Likewise, work by Maxwell (2000) challenged traditional interpretations by looking at how the ingestion of poisonous creatures during Maya ritual events could affect the body. This communication between archaeological context and zooarchaeological results can significantly enhance finer levels of interpretations from our faunal assemblages.

Finally, once results have been readied for dissemination we need to have a better integration of publications and research in both English and non-English presentations; this is especially true of the Americas, where two separate communities of researchers exist with scant overlap (Emery, this volume). What's more, faunal analysis must not remain embedded in the appendices of field reports, but must find its way to a larger audience after first passing through all the academic rigors required of appropriate scientific method and publication.

The authors of this journal go far beyond lamenting the difficulties that research faces in studying in a tropical environment. It is only when we collectively present our ideas, along with our trials and tribulations, that we see that in our frustration we are far from being alone. The improvements these papers offer, in both methods and interpretations, have applicability throughout the world.

Kitty and I found a sense of rejuvenation in our research following the 2003 SAA forum. We hope that our fellow authors and our readers will similarly find great research potential and inspiration in this *Archaeofauna* special issue.

REFERENCES

- BROWN, L. 2003. Contemporary Maya Hunting Shrines. Paper presented at the Society for American Archaeology 68th Annual Meetings. Milwaukee.
- HUDSON, J. 1991. Nonselective Small Game Hunting Strategies: An Ethnoarchaeological Study of Aka Pygmy Sites. In: Stiner, M. (Ed.): *Human and Prey Mortality*. Westview Press, Boulder.
- MAXWELL, D. 2002. Beyond Maritime Symbolism: Toxic Marine Objects from Ritual Contexts at Tikal. *Ancient Mesoamerica* 11: 91-98.

- McKILLOP, H.; WINEMILLER, T. & LYONS, K. 2003: Sea Level Rise and Variable Preservation of Ancient Maya Fauna in the Port Honduras, Belize. Paper presented at the Society for American Archaeology 68th Annual Meetings, Milwaukee.
- TEETER, W. G. 2001: Maya Animal Utilization in a Growing City: Vertebrate Exploitation at Caracol, Belize. Ph. D. Dissertation. Los Angeles, CA, UCLA.
- TEETER, W. G. 2004: Animal Utilization in a Growing City: Vertebrate Exploitation at Caracol, Belize. In: Emery, K. F. (Ed.): *Maya Zooarchaeology: New Directions in Method and Theory*: 177-191. UCLA Cotsen Institute of Archaeology Press, Los Angeles.
- ZEDER, M. 1991: *Feeding Cities*. Smithsonian Institution Press, Washington.